REMARKS

Claims 1-23 are pending in the application. In the Office Action at hand, Claims 6-23 are withdrawn from consideration, and Claims 1-5 are rejected.

Claims 1-3 are rejected under 35 U.S.C. §103(a) as being unpatentable over Itzutsu in view of Patrick or Ito. In addition, Claims 4 and 5 are rejected under 35 U.S.C. §102(b) as being unpatentable by Schonberg. In response to the Section §103(a) and §102(b) rejections, the Applicant respectfully submits that Claims 1-5, as amended, are not obvious or anticipated by Itzutsu, Patrick, Ito and Schonberg. Reconsideration is respectfully submitted.

Independent Claim 1, as amended, recites a gas conversion system for removing NO_X and SO_X from gases and includes a duct having a cross section through which the gases flow. The duct can have a port for introducing a reaction agent into the duct to the gases. First and second electron beam emitters can each have a single exit window mounted to the duct over openings in the duct opposite from each other for directing opposed electron beams into the duct and causing components of the NO_X, SO_X and reaction agent to react to remove NO_X and SO_X from the gases. The duct and the electron beam emitters can be sized to provide complete electron beam coverage across the cross section of the duct with generally evenly dispersed electrons. Independent Claim 3, as amended, recites a treatment system for removing a compound, and independent Claim 4, as amended, recites an electron beam treatment system.

Claims 1, 3 and 4 have been amended to recite "a duct having a cross section", and "the duct and the electron beam emitters being sized to provide complete electron beam coverage across the cross section of the duct with generally evenly dispersed electrons". Support for these amendments is found at least in FIGs. 3-5, as well as on page 5, lines 3-10, page 7, lines 9-12 and page 9, line 8 through page 12, line 3, of the Specification as originally filed. In addition, Claim 5 has been amended to define VOCs as volatile organic compounds as requested by the Examiner.

In embodiments of the claimed invention, the electron beam generators and the duct can be sized to provide complete electron beam coverage over the cross section of the duct, for example, as shown in FIGs. 3 and 4. In addition, the electron beam generators can provide

electron beam coverage with generally evenly dispersed electrons, as shown in FIGs. 3 and 4. As a result, the gas, compound or substance flowing through the duct can be generally evenly treated with electrons at any particular location within the cross section of the duct, thereby resulting in consistent and thorough treatment.

In contrast, Itzutsu discloses treating flue gas with a single electron accelerator 8 in a process vessel 4 with ammonia (FIGs. 1 and 6). As can be seen, the electron beam is a diverging beam so that the electrons spread out from each other moving away from the electron accelerator 8. For example, in FIG. 1, by following the diverging path of the electrons shown by the outwardly angled arrows from accelerator 8, it can be interpolated that the electrons at the bottom of the process vessel 4 become spaced about 3 times further apart from each other than when first entering at the top of the process vessel 4. Consequently, the concentration or dispersion of the electrons in the process vessel 4 will be different at different locations within the process chamber. This results in an uneven dispersion of electrons across the cross section within the process vessel 4, and likely uneven or inconsistent treatment of the flue gases in different locations within the process vessel 4.

Patrick discloses a treatment apparatus including a duct 12 having opposed electron beam guns 22 mounted to the duct 12. As can be seen in FIGs. 5 and 6, the windows 11 of the electron beam guns 22 extend only across the middle half of the duct 12, and as a result, the other 50% of the width or cross section of the duct 12 does not experience electron beam coverage (See FIG. 6). To compensate for the partial electron beam coverage, the interior of the duct 12 includes drag elements 23 and spaced apart bars 24 which direct the majority of flow toward the center of the duct 12 in line with the electron beam window 11. Since the bars 24 are spaced apart, a percentage of the flow will likely pass through the spaces between the bars 24 and get past the electron beam window 11 in regions that do not have electron beam coverage (50% of the duct's width or cross section), thereby escaping irradiation.

Ito discloses in FIG. 1 opposed electron beam accelerators 3 mounted to a waste gas duct 1. The electron beams 4 emitted by the electron beam accelerators 3 are diverging beams and as can be seen, the electrons can diverge about 3 times further apart from each other as they reach

the middle of the duct 1. This results in an uneven dispersion of electrons across the cross section of the duct 1 as previously discussed. In addition, as shown by lines 5, there are regions within the cross section of the duct 1 which are not even reached and treated by the electron beams 4.

Accordingly, Claims 1-3, as amended, are not obvious in view of Itzutsu, Patrick and Ito, since none of the references, alone or in combination, teach or suggest "the duct and the electron beam emitters being sized to provide complete electron beam coverage across the cross section of the duct with generally evenly dispersed electrons", as recited in Claims 1 and 3, as amended. Therefore, Claims 1-3, as amended, are in condition for allowance. Reconsideration is respectfully requested.

Schonberg discloses in FIG. 2, opposed electron beam sources 18 mounted to a reaction chamber 12. The individual electron beam generator or source is shown in FIG. 1 and has two successive exit windows 24 and 25. Electrons pass through the first exit window 24 before passing through the second exit window 25, which scatters the electron beam in a diverging manner, for example, as seen in FIG. 3(a). As a result, as previously discussed, there is an uneven dispersion of electrons across the cross section of the reaction chamber 12, and likely uneven or inconsistent treatment of the gases in different locations within the reaction chamber 12.

Accordingly, Claims 4 and 5, as amended, are not anticipated by Schonberg since Schonberg does not teach or suggest "first and second electron beam emitters each having a single exit window", and "the duct and the electron beam emitters being sized to provide complete electron beam coverage across the cross section of the duct with generally evenly dispersed electrons", as recited in Claim 4, as amended. Therefore, Claims 4 and 5, as amended, are in condition for allowance. Reconsideration is respectfully requested.

Finally, new dependent Claims 24 and 25 are added to more particularly claim the present invention.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By_____
Darrell L. Wong
Registration No. 36,725
Telephone: (978) 341-0036
Facsimile: (978) 341-0136

Concord, MA 01742-9133
Date: September 24, 2007